

ORIGINAL ARTICLE

Significance of Intercropped Flowers in Coconut Based Cropping Systems under Bastar Region of Chhattisgarh

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ABSTRACT

The present investigation recorded the highest gross and net income under *gaillardia* (₹ 93000 and 56870 respectively) followed by the gross income in *tuberosa* (₹ 83200) while the net income in *marigold* (₹ 44320). The highest B: C ratio was observed in *gaillardia* (2.50) among all the other flower crops followed by *marigold* (2.30) during the Kharif season. Whereas in the Rabi season *gladiolus* recorded the maximum gross and net returns as intercrops (₹ 112400 and 56820 respectively) followed by the gross returns in *gerbera* (₹ 106800) and net returns in *tuberosa* (₹ 43900). The B: C ratio of *China aster* (1.32) was observed to be the highest with regard to the other flowers followed by that of *gladiolus* (1.02).

Keywords: Intercropping, coconut, *tuberosa*, *marigold*, *gerbera*

Received 15.02.2018

Revised 19.05.2018

Accepted 17.06.2018

How to cite this article

Beena Singh, P. K. Salam, K. P. Singh and Rajesh Patel. Significance of Intercropped Flowers in Coconut Based Cropping Systems under Bastar Region of Chhattisgarh. Adv. Biores., Vol 9 [4] July 2018:152-154

INTRODUCTION

Coconut as a monocrop often generates less revenue to farmers even with an optimal planting density. However, there is a large area of land beneath the canopy of coconut plantations available for the farmer to use. Over 80% of the active roots occur in the 25–60 cm soil layer in a 2 m radius around the palm, leaving 70-75% of the soil available for use by other crops [1]. In the yielding phase, coconut utilizes only 25% of the land area and offers greater scope for intercropping. Tuber crops, fruits crops, rhizomes, cereals, pulses and vegetables can be grown well under coconut garden [5]. Landscaping the coconut plantation with traditional and underutilized flower crops is a new trend towards eco-tourism promotion apart from enhancing the farm income. Coconut being grown predominantly in small and marginal holdings, intercropping will certainly help to enhance income and employment opportunities of the growers [3]. As reported by Mohandas [2] the coconut based cropping system involves the cultivation of compatible crops in the interspaces of coconut leads to considerable increase in the production and productivity per unit area by increasing the cropping intensity by more efficient utilization of sunlight, soil, water and labour.

MATERIAL AND METHODS

The present experiment was performed under the All India Co-ordinated Research Project on Palms at S.G. College of Agriculture and Research Station, Jagdalpur centre during the academic session 2016-17. The area lies at an altitude of 850m above mean sea level that ranges between 20° 34' N latitude and 82° 15' E longitude. The experiment was laid in Randomized Block Design with four replications and five treatments with four palms per plot. Different flowers were considered as particular treatments viz., T-1: Coconut + *Tuberosa*, T-2: Coconut + *Gerbera*, T-3: Coconut + *Gaillardia* (Kharif) & *Antirrhinum* (Rabi), T-4:

Coconut + Zinnia (*Kharif*) & Gladiolus (*Rabi*), T-5: Coconut + Marigold (*Kharif*) & China aster (*Rabi*). The soil of the experimental site was silty-loam to clayey-loam, rich in silicon while prone to excessive cementing nature with low contents of organic matter, zinc, nitrogen, phosphorus, potash and boron. pH range was between 5.5 and 6.1. The recommended intercultural operations were practised at regular interval. All the observations were based on the basis of growth & yield characteristics of flowers.

RESULTS AND DISCUSSION

Average production of coconut in experimental plots of flowers was about 72.5 nuts/palm/year. The present investigation deduced that coconut as a monocrop generates comparatively less revenue as compared to the intercropped plots. The results on the *Kharif* flowers revealed the maximum plant height in the intercropped zinnia flowers (153.8 cm) followed by gerbera (136.2 cm). The number of flowers varied from 11.6 in gerbera to about 48.2 in zinnia followed by 48.1 in marigold. The highest gross and net income was recorded under gaillardia (₹ 93000 and 56870 respectively) followed by the gross income in tuberose (₹ 83200) while the net income in marigold (₹ 44320). The highest B: C ratio was observed in gaillardia (2.50) among all the other flower crops followed by marigold (2.30). The diffused sunlight facilitates growing a number of shade tolerant crops in the interspaces enabling better use of natural resources [3]. Nelliath [4] reported that coconut is a perennial palm and survives for more than 60 years. Nearly 60 per cent of space in 7.5 x 7.5 m spaced adult coconut gardens and 40 per cent of sunlight are left unutilized which provides ample scope for raising soil, climate and market specific intercrops profitably with synergistic effect on coconut.

Table: 1 Growth and Yield Characters of *Kharif* season intercropped flowers

S.No.	Crop	Plant height (cm)	No. of branches	No. of flowers	Yield of flowers /plot (100 sqmt)	Gross Income	Cost of cultivation	Net income	B:C Ratio
1.	Tuberose	103.4	1.1	25.2	832 no's	83200	45620	37580	1.82
2.	Gerbera	136.2	1.0	11.6	160 no's	80000	54420	25580	1.47
3.	Gaillardia	39.75	10.2	45.6	62 kg	93000	36130	56870	2.50
4.	Zinnia	153.8	9.5	48.2	34 kg	68000	39970	28030	1.70
5.	Marigold	38.6	10.8	48.1	51 kg	76500	32180	44320	2.30
CD at 5%		22.80	5.72	6.40	-	-	-	-	-
SE(m)		7.31	1.83	2.05	-	-	-	-	-

Table 2: Growth and Yield Characters of *Rabi* season intercropped flowers

S. No.	Crop	Plant Height (cm)	No. of Branches	No. of flowers	Yield of flowers /plot (100 sqmt)	Gross Income	Cost of cultivation	Net income	B:C Ratio
1.	Tuberose	64.1	1.2	30.2	894 no's	89400	45500	43900	0.96
2.	Gerbera	38.3	1.2	12.4	1068 no's	106800	70565	36235	0.51
3.	Antirrhinum	42.7	12.3	58.7	42 kg	84000	64100	19900	0.31
4.	Gladiolus	81.3	1.0	29.2	562 no's	112400	55580	56820	1.02
5.	China Aster	25.2	9.4	15.3	19 kg	57000	24518	32482	1.32
CD at 5%		13.41	1.90	15.70	-	-	-	-	-
SE(m)		4.43	0.63	5.19	-	-	-	-	-

With regard to the *Rabi* flowers raised in the experimental area, the maximum plant height was recorded in gladiolus (81.3 cm) followed by tuberose (64.1 cm). The number of flowers ranged from 12.4 in gerbera to 58.7 in antirrhinum. Among the flowers gladiolus recorded the maximum gross and net returns as intercrops (₹ 112400 and 56820 respectively) followed by the gross returns in gerbera (₹ 106800) and net returns in tuberose (₹ 43900). The B: C ratio of China aster (1.32) was observed to be the highest with regard to the other flowers followed by that of gladiolus (1.02). Perusal of data deduces that growing flowers as intercrops in the coconut garden is not only effective in maintaining the natural beautification in the area and improving land use efficiency but also helps in generation of revenue with very less care.

Basically coconut seedlings are planted 7.5 m to 9.0 m apart therefore the wider interspace among the trees offers opportunities for raising other crops between them. Either annuals can be raised as

intercrops or else perennials as mixed crops. In case such inter or mixed cropping is practised, nearly 2m basin round the palms should be left un-cropped in order to perform cultural operations in the main crops. In general vegetables and few medicinal crops are commonly being raised in the inter spaces between the coconut garden however the present experiment proves that raising flowers as inter crops is also remunerative and can be used widely in practise in order apart from beautification it could also act as a source of additional income to the growers.

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